

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 February 2005 (17.02.2005)

PCT

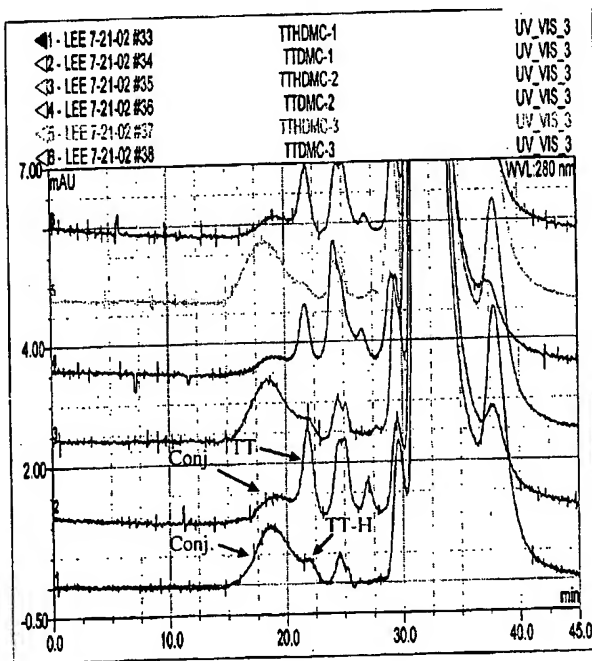
(10) International Publication Number
WO 2005/014037 A2

- (51) International Patent Classification⁷: **A61K 39/02**, 39/385, 39/39
- (21) International Application Number:
PCT/US2004/025477
- (22) International Filing Date: 6 August 2004 (06.08.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
60/493,389 6 August 2003 (06.08.2003) US
- (71) Applicant (for all designated States except US): **THE GOVERNMENT OF THE UNITED STATES OF AMERICA**, as represented by **THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES [US/US]**; National Institutes of Health, Office of Technology Transfer, 6011 Executive Blvd, Suite 325, Rockville, MD 20852-3804 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **LEE, Che-Hung, Robert [US/US]**; 116 Amberleigh Drive, Silver Spring, MD 20905 (US). **FRASCH, Carl, E. [US/US]**; 13100 Burlwood Drive, Rockville, MD 20853 (US).
- (74) Agent: **SIMPSON?, Andrew, H.?**; Knobbe, Martens, Olson and Bear, LLP, 2040 Main Street, Fourteenth Floor, Irvine, CA 92614 (US).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

[Continued on next page]

(54) Title: POLYSACCHARIDE-PROTEIN CONJUGATE VACCINES

Comparison between conjugation Method A and conventional reductive amination conjugation by HPSEC at 280 nm using a Waters Ultrahydrogel 2000 column



(57) Abstract: Abstract of the Disclosure Methods for synthesis and manufacture of polysaccharide-protein conjugate vaccines at high yield are provided. The methods involve reaction of a hydrazide group on one reactant with an aldehyde or cyanate ester group on the other reactant. The reaction proceeds rapidly with a high conjugation efficiency, such that a simplified purification process can be employed to separate the conjugate product from the unconjugated protein and polysaccharide and other small molecule by-products.



(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— ~~without international search report and to be republished~~
upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv)) for US only

2006